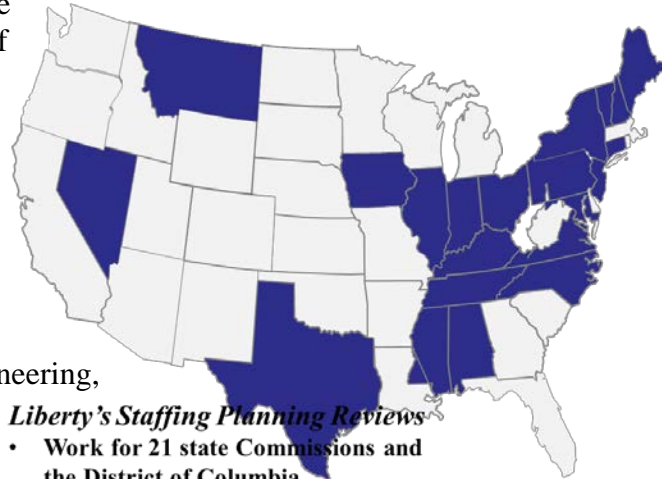


## A. Reviews of Utility Staffing Planning

The Liberty Consulting Group has been examining staffing planning and management for over two decades at utilities across the country and for some twenty utility regulatory authorities in the U.S. and two in Canada. These engagements include broad reviews of staffing across all functions (in comprehensive management and operations audit, and in a number of engagements for public utilities) as well as highly focused reviews that examine staffing and performance issues within specific areas involving significant technical expertise, such as:

- T&D planning, design, engineering, operations, and maintenance
- Outage planning and response effectiveness
- Customer service
- Fuel and energy procurement and management
- Benchmarking key operational resources and results
- Corporate service group use and optimization of contracted resources.



*Liberty's Staffing Planning Reviews*  
• Work for 21 state Commissions and the District of Columbia Commission (blue)

In the past year alone Liberty has performed or is in the process of performing the following projects that involve reviews of utility staffing:

- Entergy Texas's exit from Entergy's multi-state, multi-operating company approach to system planning and operation; review included planning and execution of organization, staffing, and systems planning changes needed to support stand-alone operation by Entergy Texas
- Review of Central Maine Power Company's assessment of the market competitiveness of services provided centrally within the Iberdrola USA structure
- Review of Pacific Gas & Electric use of risk assessment to drive electricity safety expenditures; included a review of the basis for identifying required programs, initiatives, and resources (with safety broadly defined to include an extensive range of generation and distribution infrastructure design, operations, and maintenance needs)
- Connecticut Gas Expansion Program; included a review of the organizational and staffing challenges imposed by the state's program to produce a major expansion of natural gas availability and use by all three of its natural gas utilities
- Newfoundland electricity reliability and outages; includes a review of organization and staffing of the separate generation/transmission and distribution entities that provide service across Newfoundland and Labrador
- Nova Scotia Power rate case; included a review of the support for changes in personnel costs arising from staffing and contractor changes and programs to address aging work force and high rates of anticipated retirements.

## B. Management and Operations Audits

Liberty is a national leader in the performance of management and operations audits of public utilities, predominantly in the electricity and natural gas industries. Liberty has performed over 20 such reviews at energy utilities across a period of over 20 years. Liberty has performed management and operations audits of electricity utilities, including investor-owned, cooperative, municipal, and statewide authority entities. The following table lists many of Liberty's prior management audits.

These audits routinely address staffing and performance issues.

Alabama Electric Coop. (G&T)	East KY Coop. (G&T)	So. Connecticut Gas
AGLR/Elizabethtown Gas	NJR/New Jersey Natural Gas	SJI/South Jersey Gas
Arkansas Western Gas	NYSEG	United Cities Gas
Central Hudson G&E	NY Power Authority	West Penn Power
Connecticut Natural Gas	NU/Public Service NH	Yankee Gas
Consolidated Edison of NY	NorthWestern Energy	A major municipal elect. utility
Dayton Power & Light	NUI/Elizabethtown Gas	Bell Atlantic

In addition to the audits summarized in the table, Liberty has performed the following Management and Operations Audits within the past five years.

### 1. Pepco Management and Operations Audit

We are now performing for the D.C. Public Service Commission a broad management and operations audit of Pepco. Our review has included an examination of distribution and customer service programs at Pepco, which has adopted major programmatic and infrastructure improvement programs in response to a series of major, weather-related service disruptions.

### 2. NorthWestern Energy

Liberty assisted NorthWestern Energy in the ongoing development of a major, long-term infrastructure improvement plan. That work included participation in a broadly-based stakeholder group, which has been engaged with NorthWestern in a many-month process of sharing ideas about service objectives, capital and O&M programs, Smart Grid development, costs of alternative future program, and future ratemaking alternatives.<sup>1</sup> Liberty's work included assistance in identifying, prioritizing, planning, budgeting, and subjecting to project management and performance measurement systems major infrastructure improvement needs affecting both electricity and natural gas delivery networks. Included was the use of metrics for determining improvement priorities and measuring progress and efficiency. The engagement included an overall assessment of U.S. infrastructure (energy and non-energy) declines, major governmental support initiatives for infrastructure improvement, Smart Grid opportunities and risks, novel utility/regulator plans for participatory infrastructure planning and cost recovery methods, the merging of urban and rural service expectations, the particular difficulties in maintaining rural

<sup>1</sup> See <http://www.northwesternenergy.com/documents/isg/Sept-09/rowepresentation9-24-09.pdf> for a brief description of the process supported by Liberty.

reliability in normal and transient conditions, and other issues surrounding the full integration of capital and O&M planning across both short and very long horizons.

### **3. Alliant Energy/IPL Management and Operations Audit**

Liberty completed a comprehensive management and operations audit of IPL and its parent, Alliant Energy, for the Iowa Utilities Board. This first ever management audit for the IUB addresses the full scope of management and operations as they affect the provision of electric and gas utility service offered by IPL. Construction programs, planning and execution, electric and gas operations, and customer service formed major areas of focus in this engagement. The audit also addressed emergency planning and response as a special area of focus. The audit followed major flooding across much of IPL's serving area. The audit also examined planning, governance, executive management, finance, budgeting, affiliate relations and transactions, and energy supply, among other areas.

### **4. Iberdrola SA/IUSA/NYSEG/RG&E Management and Operations Audit**

Liberty performed for the New York Public Service Commission a management and operations audit of Iberdrola SA/Iberdrola USA/NYSEG and RG&E. Iberdrola operates five major U.S. utility operations: electric and gas service in New York by NYSEG, electric and gas service in New York by RG&E, and electric service in Maine by Central Maine Power. Iberdrola USA also operates small natural gas utility operations in Maine and New Hampshire. It also provided, until recently, natural gas delivery through larger utilities elsewhere in New England. Iberdrola USA also operates a variety of New York and New England subsidiaries in a number of different business areas. A separate U.S. subsidiary of the Spanish-based parent operates the second largest wind generation business in this country. The scope of this audit included how New York's two electric and two natural gas utilities manage and conduct and are affected by: (a) governance at the holding company and utility level, (b) structure, operations, costs, efficiency, and allocations of the service company serving U.S. utility and non-utility operations, (c) construction program planning, (d) system management and operations programs, (e) work force management, (f) performance measurement and management, (g) supply planning and operations, and (h) wholesale markets (ISO issues).

### **5. Con Edison Management and Operations Audit**

Liberty performed a management and operations audit of Consolidated Edison Company of New York for the New York Public Service Commission. This audit came in response to a commission request for detailed analysis of the forces and factors producing what has become for the company a greater than \$2 billion annual construction budget, as it strives to address aging infrastructure in the country's most densely populated metropolitan area. Construction program planning and execution for the company's three utility businesses (electricity, natural gas, and steam) formed a major focus of this audit. Liberty also examined governance, planning, budgeting, work force management, contractor management, field procurement and fleet management, performance measurement, and compensation. Other focus areas included the procurement of electricity capacity, energy, and ancillary services (including hedging), and the development and management of a natural gas supply, transportation, storage, and hedging portfolio, the procurement of natural gas commodity, and the maximization of portfolio value

(through, *e.g.*, off-system sales and capacity releases).

Liberty recommended and performed an audit that examined the Commission's established focus areas as elements in a cycle of inter-related functions and activities that combined to drive the utility's expenditures. This audit was also notable for its experimental approach seeking to build consensus among utility, commission, and Liberty about the most significant findings and conclusions (and particularly recommendations to address improvement needs found) while audit field work remained underway.

## **6. AGLR/ETG Affiliates and Management Audit**

Liberty completed a management and operations audit of AGLR/Elizabethtown Gas. This was the third such audit Liberty performed of New Jersey natural gas LDCs for the Board of Public Utilities. Its scope included, among other issues, reviews of organization structure; risk management; utility focus within a holding company structure; transactions between the utility and affiliates; performance of centralized services by the corporate entity; resource numbers and qualifications; and procedures, policies, systems, practices, and activities associated with the planning, execution, and details of energy purchases and sales and of corporate and infrastructure planning, budgeting, performance measurement, compensation, system construction, operations, maintenance, and customer service.

## **C. Gas LDC System Design, Construction, Operation, and Safety Reviews**

### **1. Connecticut's Statewide Natural Gas Infrastructure and Availability Expansion Initiative**

Liberty is currently serving as an extension of the Staff of the Connecticut Public Utility Regulatory Authority (PURA) for consideration of proposals for a massive expansion of the gas distribution system in the state. Connecticut's gas distribution systems share the problems of older systems in the Northeast U. S., including cast-iron mains and corrosion problems. The state has established a major initiative to produce a massive expansion of the natural gas availability for economic and environmental reasons. This initiative will require very large capital expenditure programs by all three of the state's major LDCs across an extended time period.

Because of multiple requirements for infrastructure enhancement, and concern about work force availability and skill levels, planning for the Gas Expansion Program is a critical concern. The companies have proposed a series of measures to coordinate with Connecticut's Department of Transportation, municipal and electric construction, and other underground utilities to expedite construction and reduce costs. Liberty has assembled a team of experts in program planning and execution to evaluate and make recommendations for improvement of the companies' proposals.

### **2. Peoples Gas of Chicago**

For the Illinois Commerce Commission Liberty performed a review and evaluation of Peoples Gas' overall operations and maintenance activities and its pipeline safety program to determine:

- Compliance with federal and state regulations

- Conformance of those activities and program with industry best practices and best practices determined by the ICC Staff in consultation with Peoples Gas.

Upon the completion of this baseline assessment, Liberty monitored the efforts of Peoples Gas to implement recommendations from our audit. Specific focus areas of the audit included:

- Excavation Damage Prevention
- Corrosion Control
- Management and Maintenance of System Assets
- Operator Qualification
- Construction System Support, Programs, and Records.

### **3. WGL Gas Pipe Leaks**

The D.C. Public Service Commission approved a long-term (at least seven-year) program by the LDC serving the city (Washington Gas Light) to encapsule or replace pipe couplings installed from 1952 to 1956 and from 1962 to 1965, and to perform other encapsulation, replacement, or repair work. The large, widespread program, which addresses both mains and services covers 40 percent of mechanical couplings and pipes in the District. The utility can recover prudent costs of the work under an automatic adjustment mechanism. The Commission retained Liberty to examine both program content and the proposed rate recovery mechanism. Following that work, Liberty has continued to review for the Commission regular status reports filed by the LDC. Those reports have addressed issues that have included:

- Sufficiency of identification of projects identified for the coming year
- Schedule progress and cost performance of work performed in the immediate prior periods
- Comparison of estimated versus actual installation progress and costs
- Sufficiency of the identification of out-year priorities, prioritization methods, and planning and estimated cost detail
- Sufficiency of efforts to relate work programs to available leak data
- Ability of the Commission to evaluate effects the program has on leak number and severity
- Quality of information addressing how specific projects in the program have been prioritized
- Ability to measure whether and to what extent the program is reducing public risks
- Ability to translate aggregate information on actual versus estimated costs at the project level, as required by the Commission
- Degree to which actual progress lags projected progress and nature, locations, and reasons for any gaps.

Virtually all of the D.C. territory comprises a High Consequence Area (“HCA”) as defined by the Pipeline and Hazardous Materials Safety Administration (“PHMSA”) of the U. S. Department of Transportation. PHMSA regulations require a Transmission Integrity Management Program for gas transmission pipelines located in HCAs. In late 2009, integrity management regulations were extended to gas distribution systems with publication of Federal rules for the Distribution Integrity Management Program (“DIMP”). Risk-based project

prioritization has been an essential element of the industry's approach to the regulations. We examined the extent to which the utility has used a risk-ranking system in prioritizing the work.

Liberty's work, which remains ongoing as the program proceeds, has entailed examinations of company processes and results for:

- Project configuration
- Project budgeting
- Risk assessment
- Project prioritization
- Project categorization for cost recovery.

This work is ongoing.

#### **4. NiSource Maine (Northern Utilities Gas Company)**

Following a growing series of problems and safety-threatening events, the Maine Public Utilities Commission retained Liberty to examine the gas safety operations and practices of natural gas distribution operations NiSource, Inc.'s Maine subsidiary. Ni Source is one of the largest LDCs in the country, with operations stretching from Texas, through the upper Midwest, to New England.

Liberty's comprehensive review examined the design, construction, operations, and maintenance approaches, methods, practices, activities, and expenditures having the potential to affect public safety. The matters having most direct relevance to the examination that the ICC seeks here include:

- Potential restraints on budgeting by corporate-level, out-of-state planning and budgeting processes and actions
- Competition among subsidiary LDCs for capital improvement funding
- Effectiveness of in-state leadership
- Availability of resources for capital investment, budget, and staffing
- Adequacy of mapping, material, construction, surveillance, pipe condition, corrosion control, and other records and documentation
- Engineering and construction staffing levels, skills and training, supervision practices, modernization of field techniques and record-keeping practices
- Leak monitoring, repair and replacement practices
- Accessibility of distribution valves along mains and service curb valves
- Abandoned and inactive pipeline practices
- Historical trends in replacement/repair expenditures
- Coordination with public agencies, customers, stakeholders
- Corporate and management commitment to and support of safety
- Investment in distribution system facilities/upgrades to improve safety
- Type, age and accuracy of facility maps
- Locating & marking practices
- Use of new technologies for locating unmapped facilities and confirming existing location records.

## 5. NorthWestern Energy

Liberty assisted NorthWestern Energy in the ongoing development of a major, long-term infrastructure improvement plan addressing both its natural gas and electricity distribution systems. That work included participation in a broadly-based stakeholder group, which engaged with NorthWestern in a many-month process of sharing ideas about service objectives, capital and O&M programs, Smart Grid development, costs of alternative future program, and future ratemaking alternatives. Liberty's work included assistance in identifying, prioritizing, planning, budgeting, and subjecting to project management and performance measurement systems the major infrastructure improvement needs affecting both natural gas and electricity delivery networks. The engagement included an overall assessment of U.S. infrastructure (energy and non-energy) declines, major governmental support initiatives for infrastructure improvement, Smart Grid opportunities and risks, novel utility/regulator plans for participatory infrastructure planning and cost recovery methods, the merging of urban and rural service expectations, the particular difficulties in maintaining rural reliability in normal and transient conditions, and other issues surrounding the full integration of capital and O&M planning across both short and very long horizons.

## 6. Management and Operations Audits of LDCs

### a. Iberdrola SA, Iberdrola USA, NYSEG, and RG&E Management and Operations Audit

Liberty performed for the New York Public Service Commission a management and operations audit of Iberdrola SA/Iberdrola USA/NYSEG and RG&E. Iberdrola operates five major U.S. utility operations: electric and gas service in New York by NYSEG, electric and gas service in New York by RG&E, and electric service in Maine by Central Maine Power. Iberdrola USA also operates small natural gas utility operations in Maine and New Hampshire. It also provided, until recently, natural gas delivery through larger utilities - two in Connecticut and one in Vermont. Iberdrola USA also operates a variety of New York and New England subsidiaries in a number of different business areas. A separate U.S. subsidiary of the Spanish based parent operates the second largest wind generation business in the U. S. The broadly-scoped audit includes how New York's two electric and two natural gas utilities manage the following items of relevance to this project: (a) construction program planning, (b) system management and operations programs, and (c) supply planning and operations.

### b. Intestate Power and Light Management and Operations Audit

Liberty completed for the Iowa Utilities Board a management and operations audit of Interstate Power and Light, a major distributor of natural gas and electricity in the Midwest. The scope of this audit included:

- Construction Program Planning
- Gas Infrastructure and Operations
- Electric Infrastructure and Operations
- Corporate and Financial Planning
- Capital and O&M Budgeting
- Gas Safety Violation Penalties
- Customer Service
- Emergency Planning
- Affiliates
- Customer Service
- Governance & Senior Management
- Board Structure and Membership
- Energy Supply
- Sale of Transmission Assets

A key part of this audit focused on IPL's natural gas operations. Liberty surveyed the key elements of gas design, construction, operations, and maintenance, including personnel planning and resource management, construction program management, engineering, and use of contractors. Liberty reviewed the overall effectiveness and efficiency of the maintenance programs as well as how the Company established maintenance goals, objectives, and programs. Liberty also reviewed inspection and maintenance programs, including Company performance in monitoring performance parameters and characteristics for the purpose of maintaining reliability. Additionally, Liberty examined the procedural and process issues related to purchasing and managing outside services.

Liberty also examined IPL's compliance with an Iowa Utilities board order assessing civil penalties related to its gas business. The Board had cited concerns about a continuing pattern of violations and management's failure to properly supervise its employees to ensure satisfaction of compliance standards. As part of the audit, Liberty reviewed quarterly compliance reports, consulting reports, filed testimony and other supporting documentation, and interviewed Company employees: to understand specific facts and details about ongoing compliance, to develop an assessment of the quality and effectiveness of IPL's compliance efforts, including any omissions or shortcomings, any notable successes, and to offer recommendations for improvement.

### **c. Con Edison Management and Operations Audit**

Liberty performed a management and operations audit of Consolidated Edison Company of New York for the New York Public Service Commission. These audits fall under a legislative requirement for the commission periodically to provide for outside audits of utility construction program management and execution. This audit came in response to a Commission request for detailed analysis of the forces and factors producing what has become for the company a greater-than-\$2 billion annual construction budget, as it strives to address aging infrastructure in the country's most densely populated metropolitan area. Construction program planning and execution for the company's three utility businesses (natural gas, electricity, and steam) was a major focus of this audit. Work in this area included detailed reviews of a sample of major construction projects, intended to verify effective implementation of design and construction processes and procedures. Liberty also examined governance, planning, budgeting, work force management, contractor management, field procurement and fleet management, performance measurement, and compensation.

For the gas distribution system, the major focus of the audit was the company's cast-iron main replacement program. The Commission had recently authorized a considerable increase in funding for that program, in the interest of accelerating it. Liberty examined the company's processes for structuring the program. Our review assessed ConEd efforts in configuring projects, developing budgets for each project, assessing risks for each project, then prioritizing projects pursuant to the risk assessments. We reviewed project execution for sample projects. Liberty selected the sample projects to obtain a cross-section of project conditions for observation of company performance.



**d. Audits for the New Jersey Board of Public Utilities**

Liberty completed four management and operations audits of New Jersey natural gas LDCs for the Board of Public Utilities:

- Elizabethtown Gas (two separate audits)
- New Jersey Natural Gas
- South Jersey Gas.

The scope of these audits included reviews of natural gas system planning, design, construction, operations, maintenance, and customer service.

**e. Other LDC Management and Operations Audits**

In addition to the more recent LDC management and operations audits, Liberty has also completed similar reviews of utilities in Arkansas, Connecticut, New Jersey, New York, and Tennessee. They have involved construction program and project planning and execution as well. They total, as shown below, 13 companies, including those discussed above.

AGLR/Elizabethtown Gas	Connecticut Natural Gas	So. Connecticut Gas
Arkansas Western Gas	Consolidated Edison of NY	SJI/South Jersey Gas
Alliant/IPL	NJR/New Jersey Natural Gas	United Cities Gas
Central Hudson G&E	NYSEG	Yankee Gas
	NUI/Elizabethtown Gas	

**D. Electric Utility Infrastructure Reviews**

Liberty has performed many focused reviews of electric system infrastructure. They demonstrate our ability to combine the knowledge of and experience with effective program and program management as carried out on a large scale. Both commissions and utilities have taken advantage of Liberty’s expertise in examining system planning, design, dispatch, construction, maintenance, and operations in an effort to improve service reliability and to identify the causes of persistent problems or major outages. Liberty’s prior work includes the multi-year program of work, during which Liberty has examined the reliability of Commonwealth Edison. The following table lists focused examinations that Liberty has performed. The NorthWestern Energy work preceded the more recent Liberty work, and it included both electric and gas systems. Multiple listings mean that Liberty performed a number of distinct engagements involving the same utility.

Alabama Power	Commonwealth Edison	Maine Public Service Co.
Ameren Illinois	Connecticut Light & Power	Pacific Gas & Electric
Bangor Hydro	Consolidated Edison	NorthWestern Energy
Central Maine Power	Central Maine Power	NorthWestern Energy
Commonwealth Edison	Georgia Power	Nova Scotia Power
Commonwealth Edison	Eastern Maine Elec. Coop.	Public Service NH
	Commonwealth Edison	United Illuminating

More detailed explanations of these engagements follow. The Commonwealth Edison and Ameren work related to emergency preparedness and response involved a specially identified focus area of the broader systems operations and reliability work addressed below.

In addition to these more focused reviews, we have performed many management and operations audit that have included reviews of the planning, design, construction, and project management of utility infrastructure. The next table summarizes them. Multiple listings mean that Liberty performed a number of distinct engagements for a client involving the same utility.

Client	Utility	Client	Utility
Arizona CC	UniSource/Tucson Electric	Kentucky PSC	East KY Coop. (G&T)
Alabama Elec. Coop.	Alabama Elec. Coop.	New Hampshire PUC	Public Service NH
Belize Electric	Belize Electric	New Hampshire PUC	Public Service NH
Colorado OCC	Public Service of Colorado	New York PSC	Central Hudson G&E
Industrial Customer Group	Portland General Electric	New York PSC	NYSEG
Iowa Utilities Board	Interstate Power & Light	Pennsylvania PUC	APS/West Penn

### 1. Pacific Gas & Electric

Liberty has just completed for the California Public Utilities Commission Staff an assessment of PG&E's use of risk assessment in forming capital and O&M expenditure requests in a major rate filing. Liberty examined risk assessments and safety expenditures related to generation and electricity delivery assets and systems. Liberty's work assessed how PG&E examined the probability and consequences of potential failures of physical assets and systems, and the impacts of those failures on public safety. Liberty reviewed the processes and activities for assessing public and employee safety risks, identifying options for addressing those risks, and analyzing the costs and benefits of proposed prevention, mitigation, and response measures.

### 2. Connecticut Electric Utilities Response to 2011 Storms

Liberty recently performed (as extension of the Connecticut Public Utilities Regulatory Authority Staff) an investigation of the Service Response and Communications of Connecticut's electric utilities to two separate 2011 storms which caused significant outages. Liberty's work included reviews of the specific areas:

1. Analysis of pre-filed testimony
2. Preparation of discovery requests
3. Auditing the electric utilities' procedures
4. Examination of the evidence
5. Cross-examination at public hearings
6. Attending staff meetings, and a report and findings on the entire outage matter that will be used in drafting the PURA's decision.

### 3. Commonwealth Edison Transmission and Distribution Systems

Liberty was engaged from 2000 through 2008 in a very extensive program of work for the Illinois Commerce Commission, for which Liberty has performed a variety of comprehensive investigative, monitoring, and ratemaking assignments associated with the Company's transmission and distribution reliability. This work began with a 2000 comprehensive examination of events surrounding and responses to a major series of outages experienced in Chicago. Liberty undertook as part of this examination a review of transmission and distribution

management, operations, and supporting systems and a review of the reliability of Commonwealth Edison's transmission and distribution systems. These projects have included:

- 2000 Investigation: Comprehensive examination of T&D and supporting management systems and review of the reliability of Commonwealth Edison's transmission and distribution systems following major outages.
- 2002-2004 Reliability Monitoring: On-site, quarterly monitoring of corrective actions to address T&D management and operations improvement needs, and on-call consulting services to investigate any significant outages.
- 2004 Review: Detailed review of the performance capabilities of Commonwealth Edison's transmission system adequacy to prevent system blackouts in the wake of the major 2003 blackout.
- 2005 Investigation: Root cause analysis of a major substation fire.

#### **4. Ameren Illinois Transmission and Distribution Systems**

Liberty performed an assessment of whether three different Ameren Illinois utilities:

- Appropriately planned, designed, constructed, inspected, and maintained their electric delivery systems.
- Adequately planned, prepared, and executed storm-service restoration efforts following a July 2006 windstorm and a November 2006 ice storm that affected hundreds of thousands of customers.

The windstorm caused service interruptions to almost one million customers in St. Louis and parts of southern and central Illinois. Over 300,000 electric customers lost service in Illinois. Restoring service completely took over a week. The winter storm caused nearly 235,000 Ameren Illinois customers to lose electric service and caused extensive tree damage, broken poles, downed lines, and the loss of nearly 100 distribution feeder circuits.

Liberty's review of Ameren was also extremely comprehensive. Liberty provided a comprehensive written report providing separate findings and recommendations for each of the three utilities. The report included the investigations' conclusions, an evaluation against each of the two major criteria noted above, and detailed recommendations for improvement that each utility can implement. Liberty was subsequently engaged in providing quarterly verifications (for a period of up to three years), against specific implementation plans and schedules, that each utility has implemented the recommendations and any initiatives each utility may plan to undertake.

Liberty's comprehensive written report addressed the following requirements that the Commission established for the engagement:

- One: Storm Description and Analysis
  - Complete and factual description of the July and November/December storms
  - The provision of data and information related to the amount of ice/snow on lines and structures, wind velocities, broken poles, other equipment damage, and company information on the effects of the storm
  - An evaluation of the accuracy of the companies' service interruption information

- Two: T&D Planning, Design, Protection, and Construction
  - Reports on: (1) the companies' planning, design, and construction of transmission, distribution, and substation facilities in general, and (2) any aspect of T&D planning, design, or construction that contributed to the ill effects of the 2006 storms
  - Evaluation of T&D lightning and animal protection systems and practices
  - Evaluation of T&D line and substation fault protection designs
  - Review of engineering resources available to perform planning, design, and construction tasks; a determination of the degree of engineering centralization and differences in engineering practices among the utilities
  - Assessment of the design criteria for physical loading on structures and overhead lines, including a determination of whether: (1) the loadings created by the 2006 storms exceeded the design criteria, and (2) the storm damage was caused by physical loadings in excess of design criteria
  - Review of T&D equipment ratings
- Three: Maintenance, Inspection, and System Conditions
  - Evaluation of the companies' T&D line, pole, substation, and relay maintenance and replacement programs, practices, and results
  - Evaluation of the companies' T&D line, pole, and substation inspection programs, practices, and results
  - Appraisal of the vegetation management program and practices
  - Root causes of T&D line and substation outages
  - Assessment of T&D and substation system conditions
  - Review of the companies' work forces
  - Assessment of the degree to which maintenance and inspection practices and system conditions contributed to the effects of the 2006 storms
- Four: Emergency Planning
  - Assessment of the companies' emergency plans and storm preparations, including the companies' training and drill procedures for emergency response
  - Review of the companies' practices related to weather and load monitoring and pre-event mobilization and communications
  - Examination of the following topics:

General Information	Administration/Resources	Recovery
Planning Process	Testing the Dry Run	Protection
Employee Services	Hazard Analysis	Disposal
Restoration Activities	Authority	Transportation
Inventory Control	Organizational Structure	Personnel Support
External Services	Communications	Equipment Maintenance
Customer Services	Emergency Plan	Procurement
Customer Types	Discharge Control	Documentation
Auditing & Accounting	Assessment	Capability Assessment
Environmental Response	Containment	Facilities
Pre-Event Activities	Post-Event Activities	Training and Drills
- Five: Restoration Performance

- Evaluation of the companies' weather and load monitoring activities, event prediction activities, pre-event alert process, mobilization of the emergency response organization, performance of the emergency response centers, performance of field command centers, and the use of outside resources
- Evaluation of the companies' outage management systems, restoration status monitoring and reporting, and damage assessment
- Evaluation of the companies' event communications and performance of call centers
- Evaluation of the performance of the companies' support organizations such as safety, security, logistics, materials, and transportation
- Evaluation of the companies' field restoration organization, processes, and performance
- Evaluation of the companies' post-event processes and performance such as ramp-down, clean-up, and post-event critiques.

## 5. Maine's System Reliability

For the Maine Public Utilities Commission, Liberty examined the reliability of the four largest electric T&D companies in the state of Maine. The areas that Liberty examined generally fell into the following categories:

Budgeting and Expenditures	System Reliability	System Planning	System Design
Equipment Ratings	Inspections	Maintenance	Vegetation Management

## 6. Southern Services Company

Liberty performed assessments of T&D standards and practices in two separate engagements conducted on behalf of Alabama Power Company and Georgia Power Company. The areas examined included:

System Protection	System Operations	Underground Network
Maintenance	Inspections	Distribution Mapping

## 7. Montana T&D Reliability

NorthWestern Corporation, which purchased the utility system of Montana Power, provides electricity and natural gas to over 600,000 customers in Montana, South Dakota and Nebraska. The electric system has more than 29,000 miles of transmission and distribution lines and associated facilities serving 299 communities and surrounding rural areas covering two-thirds of Montana, eastern South Dakota, and Yellowstone National Park in Wyoming. The Montana Public Service Commission became concerned about the maintenance of NorthWestern Energy's transmission and distribution system reliability resulting from financial problems experienced in non-utility operations. The Company selected Liberty because it was a firm recognized to be experienced in the field and having substantial credibility with regulators for candor and objectivity to perform an evaluation of the utility's overall transmission and distribution systems. Liberty's review addressed the following subjects:

- Inspection, maintenance, replacement, and upgrading of equipment and overall transmission and distribution system

- System performance compared to other similarly situated utilities
- Collection, analysis, use, and adequacy of system reliability data and indices to evaluate system reliability
- Work priority guidelines and the sufficiency of the resulting expenditures
- Comparison of existing T&D standards and practices with good-utility standards and practices.

Liberty’s examination addressed and produced recommendations in the following specific areas:

Interruption Frequency	Equipment Failures	Vegetation Management
Relays	Substation Maintenance	Pole Maintenance
Inspection Program	Distribution Planning	Cable Failures
Animal Induced Failures	Inspection Schedules	Financial Forecasts
	Staffing	

## 8. Nova Scotia Power

Liberty performed for the Nova Scotia Utility and Review Board an examination of the transmission system of Nova Scotia Power. The assignment came in the wake of a 100,000-customer, fall 2004 outage that produced pole, tower, and conductor failures that left many without electricity for days. The outage also overwhelmed the utility’s call center. Liberty’s review examined: (1) system maintenance, inspection, structural design, materials, staffing, and related matters, (2) system planning, operations, system design, lessons learned, and other matters, and (3) utility communications, call center operations, staffing, outage management system, lessons learned, and related matters.

Liberty’s examination included the following subjects:

- System Maintenance and Design
- Field examination of structures to determine general condition, failure causes, and prevalence of dangerous conditions
- Utility assessments of failure causes
- Pole, tower, hardware, and conductor inspection, maintenance and testing programs
- Inspection records to assess adequacy of dangerous condition identification and response
- Inspection frequency, documentation, quality, and conformity with company procedures and good-utility practice
- Prioritization of corrective maintenance tasks identified by its inspection program and tracking and monitoring of corrective maintenance tasks to completion
- Vegetation management program compared to programs employed by other North American utilities
- Protective relay scheme designs, relay scheme maintenance programs, actual maintenance practices
- Outage event review process

- Process for identifying incoming major storms, precautionary actions, and operator training for major storm events
- Controls for assuring operation of the system according to planning and ratings criteria
- Dispatching of line technicians and materials, construction methods, and the level of staffing of line technicians
- Inventorying of replacement poles, towers, hardware, and conductors
- Emergency supply agreements with suppliers and other utilities
- Pole and tower design criteria, including material and construction specifications
- Process for incorporating lessons learned from prior events
- Transmission System Planning and System Design
- Single-line diagrams, load flow and other data and analysis concerning constraints to electricity flow in the system
- Adequacy of the system to meet contingencies in accordance with applicable system design criteria
- Monitoring program ability to isolate and minimize outage areas
- Adequacy of fault indication devices
- Adequacy of system design criteria and conformance with, coordinating council design and operations criteria
- Load forecasting techniques
- Ratings applied to system components to ensure they are not overstressed
- System models employed and suitability for prediction of system study results
- Operator procedures and capability at the Energy Control Centre during incidents
- Communications and Outage Response
- Call center ability to handle normal and emergency call volumes
- Staffing levels of call center during normal and emergency operation, benchmarked against other North American utilities
- Outage management system capabilities and performance
- Basis for outage notification.

## E. Customer Service

Liberty has examined customer service in virtually all of its two dozen management and operations audits, which are detailed previously in this section. Liberty has also performed a number of focused evaluations of important elements of customer service management and operations.

Client	Utility	Client	Utility
Colorado Springs	Municipal Utility	New York PSC	NYSEG
Connecticut DPUC	Connecticut Natural Gas	Nova Scotia UARB	Nova Scotia Power
Connecticut DPUC	So. Connecticut Gas	New York SC	Central Hudson G&E

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Connecticut DPUC	Yankee Gas	Ohio PUC	SBC/Ameritech
Dayton Power & Light	Dayton Power & Light	Pennsylvania PUC	West Penn Power
Illinois CC	Commonwealth Edison	Pennsylvania PUC	Bell Atlantic
Kentucky PSC	East Ky. Coop. (G&T)	Stillwater, Oklahoma	Municipal Elect. Utility
New Hampshire PUC	NU/Public Service NH	Tennessee RA	United Cities Gas

Additionally, in 2011 Liberty performed a management and operations audit of the customer service function of KU/LG&E for the Kentucky Public Service Commission. Included in this work was a focused management audit of two Kentucky utilities to examine all customer service related functions. The scope of that focused management audit included a review of all customer service related functions including meter reading, customer-related accounting functions, customer information systems, billing and collections, call center functions, marketing functions, service installations, and disconnect and reconnect practices.

Liberty evaluated the Customer Operations Practices and Policies, including:

- Sales/Account Management
- Customer Relations and Marketing
  - Customer Service
  - General Business Accounts
  - Industrial/Commercial Accounts
- Customer Information Systems
  - Customer Care System
- Call Center Operations
- Customer Accounting
- Customer Complaints and Resolution
- Credit and Collections
  - Billing and Collections
  - Security Deposit Policies
- Field Services
  - Meter Testing and Related Records
  - Service Installations
  - Meter Reading
  - Disconnect and Re-Connect
  - Retail Offices.

Liberty also reviewed Operations and Maintenance expenditures, Capital Budgeting and Spending, and Strategic Planning as they concern customer-service related functions. Liberty reviewed all aspects and functions of the new customer system, the CCS system, and how the system supported Customer Operations activities and functions.

Christine Kozlosky, Liberty's customer service specialist, reviewed utility customer service management and operations many times for Liberty and before joining Liberty, with whom she has been working for many years. Chris has also led best-practice surveys addressing customer



services for multi-company groups, she has published newsletters addressing utility customer-service practices, and she is a recognized national expert in this field. Chris also has extensive experience in competitive, functional, and process-based benchmarking, both inter-company and multi-company performance comparisons.

## **F. Other Benchmarking and Metrics Analysis**

### **1. Arizona Public Service Benchmarking**

For the Arizona Corporation Commission, Liberty performed a benchmarking analysis of Arizona Public Service. This study covered a ten-year audit period and benchmarked Arizona Public Service's performance with the following metrics:

- Operational Performance, including safety, reliability, customer satisfaction, coal plant performance, nuclear performance, and sustainability
- Cost Performance, including O&M expenditures, capital expenditures, and management and regulatory expense
- Financial Performance, including overall financial performance, cash flow metrics and financial risk measures
- Affiliate Expenses
- Hedging & Risk Management.

Liberty designed four separate panel groups of peer companies in order to perform this benchmarking study.

### **2. Benchmarking Experience of Christine Kozlosky**

Chris Kozlosky has been providing customer service performance benchmarking and performance improvement consulting since the early 90s, specializing in billing operations, call centers, credit and collection, field services, payment processing, business office operations, customer satisfaction measurement, and emergency response/outage communications. She has conducted significant research into customer care best practices, process improvement, and performance benchmarking and maintains an extensive database of customer service metrics from companies in all industries. Additionally, she offers an online benchmarking service to assist companies in ongoing performance measurement and best practice discovery. Publications include:

- Call Center Strategies
- Call Quality Improvement
- Credit & Collections Practices
- Achieving First Call Resolution
- IVR Improvement Strategies
- Reward & Recognition Program Profiles & Best Practices
- Improving Front-line Recruitment & Hiring
- Improving Front-line Training
- Improving Front-line Performance
- Billing & Payment Profiles & Best Practices
- Meter Reading Profiles & Best Practices

- Improving Field Services.